

**REMARKS**

The Applicant thanks the Examiner for the substantive review and detailed examination provided in this case. Claims 1, 11, 17 and 27 have been amended. Support for the amendments may be found in at least paragraphs 0013 and 0032-0056 of the specification. Claims 29 and 30 have been added. Support for claims 29 and 30 may be found in at least paragraph 0049 of the specification. No new matter has been added as a result of these amendments. Claims 1-30 are pending in the application.

The Examiner has objected to the drawings under 37 C.F.R. 1.83(a). FIG. 1 has been amended to include a virtual reality system as described in the specification and the claims. The virtual reality system may include a visual system, such as virtual reality glasses, an audio system and/or a haptic system. No new matter has been added by this amendment. This amendment merely pictorially represents features of the invention described in the originally filed specification and claims, such as in paragraph 0048, without limitation.

In addition, a representation of an electrolyte plug has been added to FIG. 1. No new matter has been added by this amendment. These amendments merely pictorially represent features of the invention described in the originally filed specification and claims, such as in paragraph 0037, without limitation.

Furthermore, clarification of the representation of the second computing unit within FIG. 1 has been added to the specification at paragraph 0051. No new matter has been added as a result of this amendment, which merely seeks to clarify the pictorial representation of FIG. 1.

Applicant believes that the above amendments are sufficient to overcome the stated objection to the drawings. Accordingly, Applicant respectfully requests that the objection be withdrawn. No new matter has been added as a result of these amendments.

**Claims 1, 4, 11, 17, 19 and 25-28**

The Examiner has rejected claims 1, 4, 11, 17-19 and 25-28 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,941,477 (Farwell '477). Applicant respectfully traverses this rejection in light of the following remarks and amendments.

Applicants submit that amended independent claim 1 is novel over Farwell '477 because the cited reference fails to teach or suggest each and every limitation of claim 1. *See*

MPEP §2131. More particularly, Applicants submit that Farwell '477 fails to teach or suggest, among other things, that "the digital acquisition unit enables real time selection of one or more specific stimuli for presentation to an examinee via the virtual reality system, wherein the one or more stimuli are designed to place cognitive demands on the examinee that disrupt the examinee's ability to conceal a countermeasure used to defeat deception detection," as recited in amended claim 1.

Farwell '477 discloses an apparatus for performing interrogative polygraphy. Three types of stimuli are presented to an examinee: Probe, Irrelevant and Target. Probe stimuli present correct details pertinent to a situation being investigated. Irrelevant stimuli are stimuli similar to the Probe stimuli that do not contain correct details regarding the situation. Target stimuli are Irrelevant stimuli for which the examinee has been requested to perform an action. *See* Farwell '477, 5:19-45. Farwell '477 uses only EEG signals that are retrieved in response to these three types of stimuli, each repeated several times, and averaged for the generation of a positive-going curve occurring approximately 300 milliseconds from the stimulus onset (P300) for comparisons based on the stimuli. *See id.*, 5:62-6:30. For example, the EEG signals for all Probe stimuli trials are averaged to determine a Probe trial average P300 curve. The Probe trial average curve is then compared with an Irrelevant trial average P300 curve. Similarly, a Target trial average P300 curve is produced from the average of all Target stimuli and compared with the Irrelevant trial average P300 curve. *See id.*, col. 7, ll. 55-61. Farwell '477 does not teach the use of continuous real-time analysis methods.

In contrast, claim 1 requires real time selection of one or more stimuli in response to signals received from the examinee. Farwell '477 cannot teach the claimed invention because averaging signals denoting an examinee's responses over an entire pool of stimuli (as performed by Farwell '477) eliminates the opportunity to present stimuli in response to signals received from the sensors at substantially the same time that the signals are received. For at least this reason, claim 1 is allowable over the Examiner-cited prior art.

Likewise, amended independent claims 11, 17 and 27 each include numerous features not disclosed by the prior art cited by the Examiner. For example, Farwell '477 neither discloses nor teaches a first computing unit that "enables real time selection of one or more stimuli for presentation to an examinee via the virtual reality system, wherein the one or more stimuli are designed to place cognitive demands on the examinee that disrupt the examinee's ability to

conceal a countermeasure used to defeat deception detection,” as required by claims 11 and 27; or “analyzing the psychophysiological data in real time [and] selecting one or more first stimuli for presentation to the examinee, wherein the one or more first stimuli are designed to place cognitive demands on the examinee that disrupt the examinee’s ability to conceal a countermeasure used to defeat deception detection,” as required by claim 17. For at least the reasons described above with respect to claim 1, claims 11, 17 and 27 are likewise allowable over the Examiner-cited prior art.

Because claim 4 depends from and incorporates all of the limitations of allowable independent claim 1, claims 18, 19, 25 and 26 depend from and incorporate all of the limitations of allowable independent claim 17, and claim 28 depends from and incorporates all of the limitations of allowable independent claim 27, claims 4, 18, 19, 25, 26 and 28 are likewise allowable over the Examiner-cited prior art.

#### **Claims 2 and 7**

The Examiner has rejected claims 2 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Farwell ‘477 in view of U.S. Patent No. 5,406,956 (Farwell ‘956). Farwell ‘956 does not overcome the deficiencies of Farwell ‘477. Farwell ‘956 merely discloses a similar system to that described in Farwell ‘477 in which Probe, Irrelevant and Target P300 stimuli are averaged over a plurality of trials to determine normalized curves. No real time selection of stimuli is enabled to be performed. Accordingly, because claims 2 and 7 depend from and incorporate all of the limitations of allowable claim 1, claims 2 and 7 are likewise allowable over the Examiner-cited prior art.

Moreover, claim 7 requires that the digital acquisition unit, including one or more amplifiers, one or more digital signal processing units and a computing unit having one or more processing devices and one or more memories, be wearable. Farwell ‘956 merely describes a headband that positions one or more electrodes. Nothing in Farwell ‘956 describes the placement of any element of a digital acquisition unit in a wearable device, much less all of the elements. For at least this additional reason, claim 7 is allowable over the Examiner-cited prior art.

**Claim 3**

The Examiner has rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Farwell '477 in view of U.S. Patent No. 5,447,166 (Gevins) and further in view of U.S. Patent No. 5,507,291 (Stirbl). Neither Gevins nor Stirbl et al., whether considered alone or in combination, overcomes the deficiencies of Farwell '477. Gevins merely teaches a human-computer interface for presenting material at a level that ensures a user's neurocognitive workload function does not exceed a defined threshold to enable a user to complete a battery of tests. Moreover, Stirbl merely teaches detecting information regarding a subject's emotional state. Neither Gevins nor Stirbl makes the use of countermeasures by an examinee more difficult to perform, as required by claim 1. Accordingly, because claim 3 depends from and incorporates all of the limitations of allowable claim 1, claim 3 is likewise allowable over the Examiner-cited prior art.

**Claims 5 and 6**

The Examiner has rejected claims 5 and 6 under 35 U.S.C. § 103(a) as being unpatentable over Farwell '477 in view of U.S. Reissue Patent No. Re 32,724 (Cartmell). Cartmell does not overcome the deficiencies of Farwell '477. Cartmell merely describes an electrode having a disposable electrolyte carrier. Cartmell does not teach providing stimuli in real time. Accordingly, because claims 5 and 6 depend from and incorporate all of the limitations of allowable claim 1, claims 5 and 6 are likewise allowable over the Examiner-cited prior art.

**Claims 8 and 20-23**

The Examiner has rejected claims 8 and 20-23 under 35 U.S.C. § 103(a) as being unpatentable over Farwell '477 in view of U.S. Patent No. 5,467,777 (Farwell '777). Farwell '777 does not overcome the deficiencies of Farwell '477. Farwell '777 merely describes a system in which "the determination of guilt or innocence consists of comparing the probe responses to the target responses...and to the irrelevant responses.... If the probe responses are similar to the target responses, one can conclude that the subject recognizes the probes...and therefore is 'guilty.'" Col. 9, ll. 31-38. In other words, the system of Farwell '777 is substantially similar to that of Farwell '477 in that it uses averaging of responses instead of performing real time selection of stimuli. Accordingly, because claim 8 depends from and

incorporates all of the limitations of allowable claim 1 and claims 20-23 depend from and incorporate all of the limitations of allowable claim 17, claims 8 and 20-23 are likewise allowable over the Examiner-cited prior art.

#### **Claims 9, 10 and 24**

The Examiner has rejected claims 9, 10 and 24 under 35 U.S.C. § 103(a) as being unpatentable over Farwell '477 in view of U.S. Patent No. 6,057,846 (Sever, Jr.). Sever, Jr. does not overcome the deficiencies of Farwell '477. Sever, Jr. merely describes providing subliminal stimuli to an individual. Such stimuli do not place cognitive demands on an examinee as required by claims 1 and 17. Because claims 9 and 10 depend from and incorporate all of the limitations of allowable claim 1 and claim 24 depends from and incorporates all of the limitations of allowable claim 17, claims 9, 10 and 24 are likewise allowable over the Examiner-cited prior art.

#### **Claims 12, 13, 15 and 16**

The Examiner has rejected claims 12, 13, 15 and 16 under 35 U.S.C. § 103(a) as being unpatentable over Farwell '477 in view of U.S. Patent No. 5,603,329 (Hosaka). Hosaka does not overcome the deficiencies of Farwell '477. Hosaka merely teaches a blood pressure monitor. Hosaka does not place cognitive demands on an examinee as required by claims 11. Accordingly, because claims 12, 13, 15 and 16 depend from and incorporate all of the limitations of allowable claim 11, claims 12, 13, 15 and 16 are likewise allowable over the Examiner-cited prior art.

Moreover, claim 12 requires the use of a second computing unit having one or more processing devices and one or more memories. Hosaka teaches computing the values of parameters using blood pressure values and pulse wave propagation times, and computing blood pressure from a pulse wave propagation time and the parameters. Hosaka, Abstract. A single CPU is used to perform each operation. *Id.*, col. 35-59. In contrast, the first computing unit and the second computing unit described in claim 12 each require one or more processing devices. As such, claim 12 requires at least two processors, one for each computing unit. Hosaka merely describes a single processor. Nothing in Hosaka teaches the use of a second processor. For at least that additional reason, claim 12 is allowable over the Examiner-cited prior art. Because

claims 13, 15, and 16 depend from and incorporate all of the limitations of allowable claim 12, claims 13, 15 and 16 are likewise allowable over the Examiner-cited prior art.

**Claim 14**

The Examiner has objected to claim 14 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Because claim 14 depends from and incorporates all of the limitations of allowable claims 11-13, claim 14 is likewise allowable over the Examiner-cited prior art.

**Claims 29 and 30**

Because claim 29 depends from and incorporates all of the limitations of allowable independent claim 1 and claim 30 depends from and incorporates all of the limitations of allowable independent claim 17, claims 29 and 30 are likewise allowable over the Examiner-cited prior art.

All of the stated grounds of objection and rejection have been properly traversed and/or accommodated. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. There being no other rejections or objections, Applicant respectfully requests that the current application be allowed and passed to issue.

If the Examiner believes for any reason that personal communication will expedite prosecution of this application, I invite the Examiner to telephone me directly.

**AUTHORIZATION**

The Commissioner is hereby authorized to charge any additional fees which may be required for this Amendment and Response, or credit any overpayment, to deposit account no. 05-0426.

Respectfully submitted,  
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Date: June 16, 2006